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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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[OFFICIAL NOTICE.]

Thirtieth Annual Meeting, American Gas Light Association.

OFFICE OF THE SECRETARY,
NEW YORK CITY, Sept. 1, 1902.

General Announcement.—There will be a meeting of the American Gas Light Association held at New York city, October 15th to 17th, 1901.

The meeting will be called to order by the President, Wm. R. Beal, of New York city, at 10 A.M., Wednesday, October 15th.

The meeting hall will be the breakfast room in the New York Athletic Club House, corner 59th street and 6th avenue.

The headquarters will be at the Plaza Hotel, 59th street and 5th avenue.

The most satisfactory quarters are always obtained by writing in advance to the hotel people, and in doing so a reply should be requested, for which a self-addressed, stamped envelope should be inclosed, as misunderstandings may thereby be averted.

The Plaza Hotel has guaranteed to accommodate 100 persons attending the meeting, at the following rates for rooms:

American plan: Single rooms $5 per day; double rooms, occupied by two persons, from $9 per day (that is, $4.50 for each person) and upwards. Some of these rooms have baths and some are without baths. The ones with baths will go to those applying first.

European plan: Single rooms, $2.50 per day; double rooms, occupied by two persons, $4 per day (that is, $2 per day for each person) and upwards. The remarks as to bath rooms on the American plan apply here also.

The Savoy and the Netherland Hotel, both situated at 59th street, on the opposite side of 5th avenue from the Plaza, have each guaranteed to accommodate 50 persons at the following rates, on the European plan:

Single rooms, without bath, $2 per day. Single rooms with bath $3 per day. Double rooms with bath occupied by two persons, $5 and $6 per day (that is, $2.50 and $3 per day for each person). For those desiring suites there will be a limited number at from $8 to $14 per day.

An effort will be made to obtain rates from some other hotels in the vicinity, and, if successful, notice will be sent to the members before the meeting.

The roll call will be made by means of the door card system. Each member upon entering the hall for the first time will, at the door, receive a special card upon which he will find his name, address, etc., as it appears on the Secretary's books, and such card should be corrected and given to the doorkeeper. Members in attendance should attend to this very carefully, as these cards are used immediately after the meeting for correcting the annual membership list. Visitors will please hand to the doorkeeper their personal cards.

A blank form of application for membership accompanies this circular. More can be obtained of the Secretary.

Remember, all applications must be in the Secretary's hands by October 15th, at the very latest, otherwise they will not be acted upon at this meeting.

LIBRARY OF CONGRESS SEP 22 1902 SMITHSONIAN DEPOSIT

The list of papers to be read at the meeting is as follows:

"Some Notes on Cement Masonry," by Mr. I. N. Knapp, Philadelphia, Pa.

"The Care and Maintenance of Incandescent Gas Burners," by Mr. McDougald Dexter, Columbus, Ga.

"The Cleaning and Repairing of Gas Stoves," by Mr. Geo. S. Clarke, Kansas city, Mo.

"Gas Rates and a Franchise Tax," by Mr. Geo. McLean, Dubuque, Ia.

Also several other papers, the exact titles of which have not yet been decided upon.

If the papers are of a sufficiently high standard, the Beal medal will be awarded to the author of the best paper presented, the question of which is best to be decided by the proper committee.

The officers are endeavoring to arrange for a lecture on some subject of interest to the members, to be delivered during the meeting.

In addition to the papers and lecture, the report of the Research Committee will deal with the question of Pipe Standards, referred to the Committee at the last meeting, and with other subjects that should give rise to a good discussion; and there will be an interesting report from the Committee on Uniform Accounts. During the days of the meeting all the announcements will be posted on the bulletin boards at the headquarters and meeting hall. All members are warned to take notice thereof accordingly. All members attending the meeting are particularly requested to wear their membership badges in plain sight, thereby greatly aiding the officers and the local committee in their work, by affording a ready means of recognition.

In order that the "Year-Book," containing the report of this meeting, may be published and issued to the members immediately after the meeting, notice is hereby given that, if any of the speakers at this meeting desire to correct their remarks before they are printed, they will be given an opportunity before leaving New York city, but not after. The stenographer will have typewritten copy of the principal discussions prepared at the headquarters between the sessions of the meeting, and all those who desire to correct their remarks must notify the Secretary at the close of the session at which such remarks are made, as all the reports will be turned in to the printer immediately after the adjournment of the meeting.

[Here follows a detailed statement respecting the special rates for transportation—one fare and one-third, going and returning by the same route—that have been promised by the named Passenger Associations. These include the Trunk Line Passenger Association, the Central Passenger Association, the Western Passenger Association and the Southeastern Passenger Association. This series virtually means that any member of the Association may avail himself of the shortened fare under the certificate plan.]

Special.—The entertainment as now planned will include for the ladies a carriage ride on one afternoon and a theater party on the evening of the banquet. For the members there will be provided a banquet at the New York Athletic Club on Thursday evening, and parties will be organized to visit the various gas works, or some of the large electric power stations, or both, on Friday, and if possible an inspection will also be made of part of the work on the underground railway now building in New York at a point where this work has been practically completed. You will be notified later of the price of the tickets for the banquet and other entertainment.

Be sure to obtain a railroad certificate when buying your ticket for New York. The greater the number of certificates handed in, the easier it is to get the reduction in rates for future meetings, since the railroad officials count the certificates turned in as marking the full attendance. In our case the number of certificates is from 50 to 100 less than that of the persons in attendance, and our requests for lower rates are not given the consideration they should receive. Apply for ticket and certificate at least 30 minutes before train time. Each person must sign his own certificate at time of purchasing tickets for New York. Be sure to hand the Secretary your certificates, accompanied by 25 cents for each one, as soon as you reach the headquarters. Apply for return ticket at least 30 minutes before train time, and have your certificates with you. All persons, ladies included, attending the meeting are entitled to the reduced rates from the territories named. Members will please hand their certificates to the Secretary or his clerk upon arrival at place of meeting. If there are 100 members present, holding certificates, each certificate will then be properly indorsed and handed back to the owner before adjournment.

Any members having questions which they desire to put into the question box should send the same to the Secretary as soon as possible, in order to give him an opportunity to have them printed and distributed to the members before the meeting, so as to secure for them careful attention.

ALFRED E. FORSTALL, Secretary.

Report of the National Gas Advertising Committee.

The following circular explains itself:

DES MOINES, IA., Sept. 16, 1902.

Gentlemen: At respective conventions of the American Gas Light Association, the Western Gas Association, and the Ohio Gas Light Association, there was appointed a representative from each Association to form a committee, to be known as the National Advertising Committee, jointly representing these Associations, the labor of which committee is to popularize the use of gas as a fuel.

It is the intention to open a central bureau for general advertising, such as reserving spaces for 6 or 7 months of the year in all the leading magazines and periodicals, and to prepare and hold in readiness such advertising matter as circulars, booklets, billboard and newspaper advertisements, cuts, etc., as can be distributed to the gas companies subscribing throughout the country, at the cost of production.

In order to carry on the proposed work, the committee must seek and ask the support, both morally and financially, of all the legitimate gas companies in the United States. It is found that there are about 32,000,000 people in the country living in districts supplied by gas; and it is thought if gas companies would subscribe, perhaps $2 for every 1,000 of the population of the districts supplied by them, would create a fund for a basis upon which to carry out this work, each company receiving a proportionate return in new advertising matter for the amount subscribed by them. This would prove a most economical method of presenting to the people of the various territories the great advantages of using gas for domestic purposes.

By taking into consideration the large amount of advertising matter that would thus be at the disposal of each subscribing company, one can readily see that this small expenditure would be of decided advantage.

To all gas companies not subscribing an additional charge will be made for such matter that they will find it necessary to have from the bureau; by which method the false notion of saving the small subscription necessary for membership would be clearly shown.

The committee solicits any suggestions or recommendations that you may desire to make in this connection, and asks for your earnest consideration of the same. In order that we may reach a definite basis of operation, the committee earnestly requests that you write, giving your views upon the subject as soon as possible, either mailing them to P.O. Box, 364, Trenton, N. J., or to any one of the committeemen at the addresses given below, where they will be gratefully received and considered.

Yours very respectfully,

EDWARD J. PRATT,
Committeeman, Western Gas Association; Pres. Capital City Gas Light Company; Des Moines, Ia.

HENRY L. DOHERTY.
Committeeman, Ohio Gas Light Association; Pres. Denver Gas & E. L. Co., Denver, Col.

FRANK D. MOSES,
Committeeman, American Gas Light Association; Chief Engineer, South Jersey Gas, Electric & Traction Company, Trenton, N. J.

BRIEFLY TOLD.

NOTES.—

WE were in error last week in stating that General Hickenlooper, of the Cincinnati Gas and Electric Company, accompanied by Superintendent W. A. Miller, had sailed for Europe with a view to inspecting the gas works of Great Britain and the Continent. The General's son is the voyager.

MR. JOHN P. HUGGINS, one of the Trustees of the Consolidated Gas Company of this city, died at his summer home, Wolfesborough, N.H., the morning of the 9th inst. He was in his 77th year. The funeral services were held at his city residence, No. 7 West 74th street, the afternoon of the 13th inst., and interment was made in Woodlawn. Deceased, who in early life took up the hotel business in New York, and amassed a fortune therefrom—he owned the Cosmopolitan Hotel at the time of his death—was one of the organizers of the Metropolitan Gas Company, of New York, and was always prominent in its management. When the Metropolitan Company was absorbed by the Consolidated Gas Company, Mr. Huggins was named a Trustee of the latter.

ANOTHER veteran well known to the gas men of this city is dead, in the person of Mr. Stephen McCormick, who had been connected with the Lamps and Gas Department of New York since 1857. In that year he entered the Department as junior clerk, and in 1872 became its chief, in which position death found him. His demise occurred the morning of the 12th inst. He was in his 75th year.

[Official Report—Revised by the Secretary.—Continued from Page 371.]

PROCEEDINGS, TENTH ANNUAL MEETING OF THE PACIFIC COAST GAS ASSOCIATION.

Held in the Rooms of the Pacific Gas Improvement Company, San Francisco, Cal., July 15th and 16th, 1902.

Second Day.—Afternoon Session.

The Secretary read the following

Report of the Library Committee:

To the President and Members of the Pacific Coast Gas Association—Gentlemen: At the meeting of the Association held in July, 1901, there was inaugurated a movement looking towards the establishment of a library for the common use of the members of the Association.

A committee composed of the undersigned was appointed to undertake the formation of a library plan. Voluntary subscriptions to the amount of $200 enabled the committee to proceed with the work and purchase such works as are in their judgment best suited to the use of members of the Association.

In furtherance of the powers invested in them, your committee beg leave to report as follows:

The $200 available for the purchase of books, while sufficient to provide a fair nucleus, is, of course, small as compared with that necessary for the complete list of works which it is hoped to ultimately place at the command of the members. It has, therefore, been deemed best to expend it in the purchase of the more recent gas books, and the following list has been so far selected and purchased:

Adams, "Light, Heat and Power."
Brackenbury, "Methods of Saving Labor."
Bates, "Gas Analysis."
Black, "Gas Fitting" (London, 1886).
Bowditch, "Coal Gas," 1867.
Burns, "Manufacture of Gas from Tar," etc.
Butterfield, "Chemistry of Gas Manufacture."
Cripps, "Guide Framing of Gas Holders."
Clegg, "Coal Gas."
Colburn, "Gas Works of London," 1865.
Colyer, "Gas Works."
Dye, "Lighting by Acetylene."
Dunbar, "Gas Fitters' Question Book."
Dyson, "Testing of Raw Materials.'
Dibden, "Photometry."
Galloway, "Gas Lighting."
Grafton, "Practical Gas Fitting."
Graham, "Regenerator Furnaces," 1894.
Gibbs, "Acetylene."
Gill, "Gas and Fuel Analysis."
Groves and Thorp "Chemical Technology," Vols. I., II. and III. (See Hunt's Gas Ltg.)
Graham, "Gas, Coal and Cannels."
Hodgett, "Liquid Fuel," 1890.
Hempel, "Gas Analysis."
Hornby, "Gas Manufacture for Students."
Hornby, "Gas Engineers' Laboratory Handbook."
Hughes, "Gas Works."
Hasluck, "Gas Fitting."
Hunt, "Gas Lighting."
Lewes, "Acetylene."
"Moore's Gas Consumer's Guide," 1871.
Newbigging, "One Hundred Years' of Gas Enterprise."
" "Handbook for Gas Engineers."
" "Valuation of Gas Works."
O'Connor, "Gas Engineers' Pocketbook."
Putsch," "Gas and Coal Dust Firing."
Phillips, "Fuel."
Perkins, "Gas and Ventilation."
Peckston, "Gas Lighting," 1841.
Richards, "Coal Gas."
Stine, "Photometrical Measurement."
Stevenson, "Modern Appliances."
Sugg, "Domestic Use of Gas."
Spice, "Purification of Coal Gas."
Travers, "Experimental Study of Gases."
Winkler, "Gas Analysis."
Weiss, "Zurich, Gas Works."
Van Eyredhaven, "Photometrical Standards."
Proceedings American Gas Light Association, Vols. XV., XVI., XVII.
" Western Gas Association, 2 Vols., 1892–1898, inclusive.
" New England Association of Gas Engineers, Vol. 1900–01.
" Brooklyn Engineers' Club, 5 Vols., 1897–1901.
" Kansas Gas, Water and Electric Light Association, 2 Vols., 1900, 1901.
Eight pamphlets, "Transactions of the American Institute of Electrical Engineers."
Several trade catalogues and unbound technical journals.

The total amount of money expended for the above books was $118.90, leaving a balance on hand to the credit of the library fund of $81.10.

While, as stated, the above list included the more recent gas publications, there are many others, some of which are now considered classics in gas literature, which should be found on the shelves of the Association library. In addition thereto, the principal chemical, philosophical and electrical works should also be included; but this can only be accomplished by the raising of additional funds, and your committee earnestly requests that the members contribute to the library fund, sending such sum, no matter how small, as they feel they can afford, and also to contribute such books relating to our business as they may have and feel that they would like to give to the library.

The list of books now owned by the Association is sufficiently important and valuable to warrant the consideration of a plan for their circulation among the members, either by book post or express, and it is hoped by your committee that the interest in the library will not be permitted to lapse, and that every member of the Association will contribute to make ours the largest and most valuable Gas Association library in this country.

Respectfully submitted, E. C. Jones, L. P. Lowe, Geo. C. Holberton, } Committee.

Discussion.

Mr. Aldrich—In carrying out a suggestion made by that committee, I advise that we get to work at once to raise sufficient funds to enable the committee to extend its sphere of usefulness. I think it would be better should the Secretary send an official communication to each gas company in this Association. I don't think that any one gas company will say no. It is far better than for us individually to say what we can do to get our companies to give something. I think we must reach 60 or 70 companies. If they give from $5 to $10 each we would soon raise an amount sufficient with which to procure some or all of these expensive books. I also suggest, when that is done, that the Secretary catalogue the books and send a list of them to each subscriber, so that when we are in want or need of help we can send to him and get the required book. I move that the report be received and adopted, and that the Secretary be instructed to communicate with each gas company reprssented in this Association, requesting a donation in aid of the library fund. The Spokane Gas Company will give $10.

Mr. Lowe seconded the motion that the report of the committee be received and adopted.

Mr. Martin—I have a suggestion which I think will accomplish the same result, and that is that all the money received in the form of dues from the associate members for the next 3 years be appropriated and used for this purpose by the library committee.

Mr. Lowe—I do not think Mr. Martin's plan is exactly the right one. It occurred to us that possibly a great many members of the Association had a book or two to which they did not pay any attention, and if they would "chip in" those books and send them to us we would have a great many more than we now have, or in lieu of that they might contribute a small sum. The average cost of a book is probably $2.50 to $3, and the members of the Association who could afford it might send us the money necessary to pay for a small book. We would still be left with the money from the associate membership for more extended work. We must have headquarters, and we must have someone at a low compensation to look after it, and possibly the dues of the associate members might maintain that department. I am hoping it will. If we spend it for books for the next 3 years we will not have it from any other source, and possibly next year the members may have a change of heart and do away with the suggested change in the constitution, but we want the books now. We have bought all the later gas works, and probably a few of the old ones, but we have not been able to buy the expensive works running into anywhere from $10 to $50 per volume, or sets of works of that description. Small contributions from the members will enable us to do that, and give us a very up-to-date library. It must not be restricted to gas works. You need works on mechanics, chemistry, philosophy, etc. Your library has no limit in its size, and I, therefore, hope we will not begin spending the money which we should raise from the members and from the companies, if they will donate it, by taking something you have only in prospect.

Mr. G. P. Lowe—Following up my illustrious namesake's remarks, I was very much impressed by the paper read by Mr. Holberton yesterday, which was supplemented by Mr. Britton to-day. The entire transactions of the Pacific Coast Gas Association appear in the *Journal of Electricity, Power and Gas*. Backnumbers of that publication are extremely rare at present, but I wish the Association to accept with my

compliments, complete sets of bound volumes of the *Journal* from bound Volume No. 1, which runs back 7 years. The value of that is $50. (Applause.) I have also, practically complete, the volumes of the *Gas World*, published in London, from the winter of 1895, which I will be glad also to donate to the library. (Applause.)

Mr. Britton—I, like Mr. Lowe, am not in favor of Mr. Martin's suggestion. I have that pet scheme of mine of establishing for the benefit of the members of this Association a headquarters in San Francisco. I believe the money to be obtained from the associate membership, that was suggested and acted upon this morning, can best be used for that purpose, and I look to see such a contribution from the gas companies of the Coast as will provide for the maintenance of that headquarters, and we will have a library of larger extent inside of a year—I am satisfied of that—from contributions; but let it also be a bureau of information. I also suggested last year the appointment of an Advisory Board. This headquarters would afford the means of getting the information to the Advisory Board and sending it out properly. Then it would become a matter of value for 365 days in the year, and do a work which no other Gas Association of the country does, and we could take up the education, not only of its members but of those allied to it in something along those same lines. The maintenance of the headquarters I do not believe would cost more than $500 or $600 a year, which would include the rental of a room and the employment of a stenographer and typewriter, who would be there ready to answer any questions and to write letters and distribute the books to the members upon any plan that may be hereafter devised. I hope the money which we will raise from the contribution of gas companies will be left for that purpose. There are people in the country who could transact all their business through this bureau of information or headquarters of this Association, and save themselves more in one year three-fold than any contribution they might make. It might be made a bureau for the purchase of necessary supplies. People in the country very often need something at once. They telephone to Dunham, Carrigan & Company, or Miller, Sloss & Scott, or whoever their people may be, and have to depend on their judgment in sending what may be necessary. Headquarters could be established where such requests from outside companies could be made to this bureau, and it could be in the nature of a purchasing bureau. Its development we can hardly count upon and the advantages to the members of the Association. For that reason I am not in favor of distributing this fund, which can do so much good, towards a library. Of course, it will do some good, but not to the extent it would in the formation of headquarters.

Mr. Jones—Would Mr. Martin's plan interfere in any way with a contribution from the members immediately for the aid of our library?

The President—Mr. Martin's suggestion is not before the house. It was not seconded.

Mr. Jones.—Then I will ask your attention. It might be that some gas companies who intend to become associate members may not do so for a year to come and our library would then be practically at a standstill. By having a simple method of mailing the books we can begin to distribute the books very soon, and as a member of the library committee I wish to say we have left orders in the East for some of the rarer and older gas books, and have people looking them up for us, so we are gradually gathering together a good collection. We will need more money to do it, but I think in the next few weeks a plan will be formulated for getting the books to our members. First of all it will be necessary to have a good catalogue of the books to be forwarded to the members.

[The motion to adopt the report of the committee was then carried.]

Mr. Britton—I move that the present library committee be continued, and that they be given power to devise and carry out means for raising subscriptions and for the distribution of the books. [Seconded and adopted.]

On motion of Mr. Britton a vote of thanks was tendered to Mr. George P. Lowe for his very generous donation.

Settling the Matter of an Official Organ.

The President—We will take up the question as to the official organ.

The Secretary—The resolutions, which were submitted in writing, are as follows:

"*Whereas*, For the purpose of securing the publication of the proceedings of this Association in all of the Gas Journals of the United States, it has been deemed expedient to rescind the appointment of the American Gas Light Journal as its official organ; now, therefore,

Be it Resolved, That this Association expresses its deep appreciation of the invaluable aid and support given it at all times during the past 10 years by the Journal, the uniform courtesy extended, and help given in the promotion of the welfare of the Pacific Coast Gas Association by the proprietors and editors of the Journal; be it further

Resolved, That this Association convey to the American Gas Light Journal assurances of its continued support, and its deep appreciation of the labor of the Journal as an able exponent of the business in which we are engaged; be it further

Resolved, That a copy of the resolutions be forwarded to the Journal by the President and Secretary of this Association.

Mr. Martin—I will say that the object of this is to have the proceedings of this Association published in all the Gas Journals, and not exclusively in one. The effect of having an official organ was that our proceedings were only published in that one Journal, and the other Journals did not publish them at all. All the other Associations I understand have no official organs, and all the papers published the entire proceedings of all the other Associations except ours. Then we will not compel our members to subscribe to any particular paper. They can get it in any of the papers.

Mr. Lowe—The American Gas Light Journal has been our warm friend. As I told you this morning, the Journal came to us at a time when we had no friends, and they put their hands into their own pockets and drew out the money to pay for the cost of reporting the proceedings of the Association. It was very nice indeed, but we have grown since that time, and it is not altogether a dignified method of conducting one's affairs; but setting that aside, we need the recognition which comes from representation in all the technical Journals of the country that will publish our proceedings—the "Progressive Age," and the other "Journal," and Mr. Lowe in his very excellent publication. We will derive one especial benefit from giving Mr. Lowe the proceedings. This volume which I have in my hand is a copy of the Proceedings of the Pacific Coast Electric Transmission Association, which is taken from the columns of Mr. Lowe's "Journal." It is gotten up in very excellent form, and can be ready for distribution shortly following any meeting. As it is now, we publish our proceedings periodically. For instance, I believe, we have not had a report for 2 years.

Mr. Britton—We publish them every 2 years.

Mr. Lowe—By adopting this method, if we will permit Mr. Lowe to get them up for us, it will save us a great deal of money, and we will have them every year, and in much quicker and better shape than we can otherwise afford. Mr. Lowe does not charge us anything for the composition; it is all there. He has paid for it himself in getting up the paper. I will ask Mr. Lowe to speak to you himself.

Mr. George P. Lowe—Very briefly, the proposition is this: With the "Electric Transmission Association," the consideration under which these transactions have been brought out is priority of publication, which is very evident is not the disposition of the Gas Association to grant, and very properly, I think, as well. The papers, as I propose, will be published first in the "Journal" along with the other papers, but I will hold the type until they are completed in the "Journal," which never takes over 3 months, and then the type as it appears in the "Journal" forms will be made over into the form of "Transactions." The cost to the Gas Association will be the cost of making over the forms from the "Journal" forms to the "Transactions forms," the cost of press work, and the cost of the paper to which should be added, in view of the fact I hold my forms, the cost of the type being several hundred dollars, the cost of the illustrations, which is very light indeed. Furthermore, the cost of the illustrations I will put into the Association at the cost to the "Journal," which is lower than the rates the Association could get direct. That very briefly is the proposition I would be glad to extend to you.

[The motion to rescind was then carried.]

The Chairman—Gentlemen, you will please listen to the report of the Nominating committee, after which will be the election.

The Secretary read the following

Report of the Nominating Committee:

To the President and Members of the Pacific Coast Gas Association: Gentlemen, your Committee appointed to nominate officers for the ensuing year, begs to report as follows:

For President.—M. C. Osborn, San Rafael.

For Vice President.—W. A. Aldrich, Spokane, Wash.

For Secretary-Treasurer.—J. B. Grimwood, San Francisco.

For Directors.—John A. Britton, Oakland; R. P. Valentine, Sacramento; C. O. G. Miller, San Francisco; Geo. H. Hollidge, Merced.

Respectfully submitted, E. C. Jones, J. W. Thomas, F. H. Eichbaum, } Committee.

ELECTION OF OFFICERS.

On motion of Mr. Keyes the report was adopted and the Secretary was directed to cast the ballot of the Association for the election to office of the gentlemen recommended by the committee.

When the Secretary reported that the instructions had been carried out, the new officers were declared elected by the President, and Mr. Osborn and Mr. Aldrich spoke as follows in response to the call of the members for speeches from them:

Mr. Osborn—The time has passed when it depends upon any one man to make or break this Association. We have become so large and have so broadened out every year, that it matters not who is your figure head for a term. It is bound to succeed. I thank you sincerely for the honor you have conferred on me, and with your help I hope our next meeting will be a complete success. Thank you! (Applause.)

Mr. Aldrich—Gentlemen, I simply do not know what to say. I wish "Johnny" would say something for me. This is an honor that ought not to have been given me, because there are many others on our rolls so much better fitted to fill that position than I am, and have done much more for the Association than I have. It has been my privilege and an honor to me to come even as far as I do to attend these meetings. (Applause.)

Mr. Lowe—Gentlemen, I don't think all of you fully realize just exactly what Mr. Aldrich has to do to attend the meetings of this Association. He must come 1,200 miles and return 1,200 miles to do so. Since I have been a member of the Association I only missed Mr. Aldrich once, and that was by force of circumstances last year. If the members who can reach this Association more easily than he should follow his example our attendance, instead of being an average of 50 or 60, would be the whole 120 or 130, or, as we hope soon to have it, 200 or 300. We are indebted to Mr. Aldrich as much as to any other member of the Association for the success of our meetings. (Applause.)

The President then introduced Mr. L. P. Lowe, who read the following paper on

THE RISE AND RECOGNITION OF THE ENGINEER, WITH ESPECIAL REFERENCE TO GAS ENGINEERING.

To the thinking and observing mind it must be apparent, indeed for many years past it must have been particularly so, that in the government and control of the affairs of the world revolutionary changes are taking place.

For centuries past the supremacy of nations has depended largely upon their physical power and ability to destroy, and in the endeavor to maintain this physical supremacy has the effort, skill and financial ability of nations been principally directed, until humanity has been burdened to the last extreme in the endeavor te support the tremendous armies and navies of the world.

These warlike creations, originally organized for purposes of defense, have grown to such stupendous proportions that in many instances their maintenance has been the cause of the wrecking and undoing of the various institutions which they were intended to defend and preserve, their supposed blessings having thus proven evils in disguise by developing within themselves their own destruction.

But these have not been the only evils suffered because of the possession of these giants of destruction, far greater ones lying in the opportunity of oppression afforded by the possession of powerful armies and navies, ever ready to obey the command of excuse where that of reason does not prevail, until the pages of history have been blackened and blood stained with the wars of revenge, the wars of conquest, and the wars of injustice and extermination which have been waged and waged by the powerful against their weak, and often defenseless adversaries.

This unfortunate condition of affairs must maintain as long as peoples are willing to preserve these vast institutions of menace; but already the voice of humanity is raised against the outrages of the past, and gradually the world is beginning to awaken and listen to the cry of reason and justice by recognizing the necessity of the peaceful arbitration of all matters of difference, be they between nations or individuals, and when this much to be desired condition is attained necessity for the soldier will have practically disappeared.

But we must not decry the good which the warrior has done, nor be unmindful of his heroic service in the past, and, indeed, those which he may unfortunately be yet called upon to render, and wonderment cannot, therefore, be expressed at the hero-worship so unstintingly bestowed upon the soldier, our past and even present court of last resort; but gradually the praise formerly bestowed upon the chieftains of old, who won their battles through sheer force of physical strength, endurance and valor, has been transferred to the warrior who fights with his brain, until to-day we find the once despised physical pigmy, with his modern development of frontal bone, the recognized superior and leader in his profession, the warrior of the past having given place to the warrior engineer of the present, and who, in turn, will give precedence to the engineer of the future.

Distasteful as it may be, one may see, by the momentary lifting of the veil, the ponderous battleship upon which countless wealth has been expended, at the complete mercy of the submarine boat, costing only a handful of coin, and the present land defenses made useless by the coming airship.

The past has not, however, been wholly without its engineers, as is amply proven by the surviving evidences of the magnificent works of the ancients, some of which show skill even in part surpassing that of the present, and which we are pleased to style the "lost arts," though which in the name of justice should be referred to as the destroyed arts, the slow, laborious, painstaking work of the engineers of old having for centuries given way to the destructive force of the warrior; but little by little, step by step, ant-like in his persistency, has the engineer made the inhabitants of the world so interdependent and necessary to each others comfort and happiness, that the light of reason is beginning to dawn, scales are falling from eyes, and the time is not far distant when the world will demand in no uncertain voice the cessation of destruction and the preservation and upbuilding of the useful arts, and then will the engineer and his co-workers, the chemist and physicist, be supreme.

To-day the government of the world may be said to rest in the hands of the statesman and politician, the statesman being supposedly of the greater assistance to mankind and better fitted to govern because of his studious attention to the wants and needs of others.

Theoretically, there should be no politicians, but they exist and are to-day viewed more in the light of birds of prey of greater or less legitimacy, by sufferance allowed to exist as possibly occupying the stepping stone to statesmanship, but as the value of the services of the engineer receives recognition, and his knowledge of the legislative needs of the people become more apparent, he will be called upon to take his place in the moulding of affairs of State, and with his advent politicians will lose their power and statesmen become more profound.

The greatest advancement of the world has been that of the nineteenth century, and if one were to name the arts which have done most for the marvelous progress and development during that period the palm would in justice be awarded to chemistry and philosophy, but as both sciences are largely theoretical, and call for the close and studious application of their devotees, the vigorous and practical application of the engineer has been required to fully develop their value. As time rolls on the necessary alliance of the chemist and engineer is more apparent, ample demonstration of this fact being found in the increasing number of published works dealing with the chemistry of engineering.

In the foregoing the meaning of the word "engineer" has been dealt with in its fullest and broadest sense, though it is well known that there are many fields of engineering of varying importance, each quite distinct and accepted as different professions, though not entirely separate, as all branches are more or less allied and interdependent. That branch known as gas engineering is the one intended to be specifically dealt with herein, and of all of the engineering professions none other calls for such a general and diversified knowledge of the others as does gas engineering, and probably none is of greater importance, dealing as it does with the all important and momentous questions of light, fuel and power, that of fuel ranking first among the scientific and mechanical problems of the day.

To those familiar with the conditions of the gas industry of to-day as compared with that of a quarter century ago, the contrast cannot but be most marked. Then artificial gas was practically of but one kind, coal gas, and its use was limited almost solely to lighting, though it is true that gas companies were then pointing proudly to the suitability of their product for use in nursery burners, or for other domestic purposes of not much greater importance. The gas engine was then an unheard of prime mover, and the gas engineer shared similar fame, although it cannot be denied there were good and progressive gas men in those days; but they unfortunately, by force of circumstances, were working in the deep rut so plainly grooved by their predecessors, and with but small desire to break away from the traditions and teachings of the early investigators in the gas world.

To remark this condition more forcibly, one has only to refer to the gas literature of the past, either as published in the technical journals of the day or in the proceedings of Gas Associations, and to compare the state of the art as it then existed with that of the present. No competitor, other than the ill smelling kerosene lamp and the poorly made

tallow dip, shared the field with the luxurious gas jet, the concern of the gas manager being shown but slightly in the disposal of his main product, gas, he deeming it of more importance to find a field for his coke, tar and ammonia, the gas looking after itself, for, commanding the field as it did, it was a question of "take it or leave it" in its most autocratic sense.

It is true that some few far-sighted engineers and managers of those days urged the importance of improvement and the reaching out and into new and unexplored fields for the extension of their business, but the average gas man paid only small heed to the so regarded "optimistic cranks" who sought to lead him into channels new, and there is no telling how long he would have drifted on in the good, old way had not his electrical competitor, in truth a blessing in disguise, forced upon him the realization of doing something whatever it might be, and for actual self-preservation he turned to the field of gaseous fuel with all its promise and neglected possibilities. But to make even a beginning in this field required ability, courage and tact, and a knowledge but little possessed by your then average gas man, and there is no telling how he would have fared had not the incandescent gas light just then made its appearance to shed a ray of hope for gas and check the advance of the "Electrical firefly," as it was then derisively referred to.

Probably no better illustration of the gas man's contempt for his electrical competitor can be given than in this bit of verse, published in one of the gas journals of that day:

Said Edison, "So, and won't the thing go
Despite how on paper we rush it?
We'll take it by storm, a company form,
And then get behind it and push it."

And they did; and how queerly sounds the verse after 20 years.

While the fraternity received the incandescent gas light with open arms welcome, coming as it did at a most opportune time as a saviour of a portion of the lighting business, one shudders at the thought of the chilliness of its reception, had it antedated electricity and seemingly gave to the gas manager naught but a declining revenue, while to the consumer it brought more value and comfort.

This mistake would, however, soon have become apparent, for while the incandescent gas light has been of value in retaining business it has been of immeasurably greater benefit in teaching the importance of recognizing the interests of the consumer and the search and development of new fields of extended usefulness of gas, all of which forced a new condition of affairs to such an extent as to call for ability which not alone knows how to produce gas of good quality at low cost, but, having accomplished that desideratum, then recognizes it as of secondary importance to its disposal; for the successful engineer of today is he who fully understands not only the manufacture but the handling and disposition of his product, save, possibly in the few cases of very large works wherein the full attention of the engineer is occupied with gas manufacture only, this being, indeed, more or less a regrettable condition, tending as it does to the restriction and narrowing of a general knowledge which may be sadly missed should a change of employment demand a broader and more comprehensive insight into a too frequently overlooked portion of the industry.

The successful gas engineer of the period, and the one whose services are always in demand, is he who has a thorough practical knowledge of his profession, with enough theoretical ability to enable him to understand the cause and effect as it were of that which engages his attention. His technical, theoretical knowledge cannot be too great, as long as it is made the servant of practice, but theory alone is of small usefulness save as a brain food to an inquiring mind, and for this reason is it that our most useful and helpful artisan, the chemist, does so little for himself in a material way, though showering multitudinous blessings on humanity by placing his knowledge at the disposal of practical men.

In the manufacture and use of gas the engineer must needs have a certain and comprehensive knowledge of that part of chemistry applying to his profession, though it is by no means necessary that he should be highly skilled therein, and indeed, unless he has much time at his disposal, an almost inconceivable condition, he would better deputize that portion of his work to the skilled chemist.

The gas engineer must also be a physicist to a certain extent, for, aside from the chemistry involved in the manufacture and use of gas, physical laws govern its handling and therein must the engineer be self-reliant and well nigh self-sufficient.

Physical laws, almost if not quite, wholly govern the distribution of gas, and their knowledge combined with the laws of chemistry, enables the engineer to ask himself that all important question, "Why." Ability to answer pre-supposes a query, and enables the seeking of cause for oneself, and when that old, fallacious saying "the long since acknowledged fact" is thrust upon one, the ability to substantiate or disprove is given by the knowledge possessed.

Probably no other saying has caused more lack of personal observation than that same old, trite "long since acknowledged fact," and whenever it is heard one should immediately become suspicious of the user and undertake personal observations.

Both mechanical and civil engineering enter into the necessities of the gas engineer, mechanics dealing with the construction of works, and civil engineering to a certain limited extent in the proper placing of gas mains, etc.

The profession of gas engineering is one which is not commonly taught, and it is usually mastered by only a few who have the love of a diversified, scientific knowledge, or who acquire it by contact with their fellow workers. The latter class predominates and gathers its knowledge by mastering one feature after another, advancing along the highway of success, or probably better said, the narrow path of success, although too often is superficial information mistaken for profound knowledge, thus continually demonstrating that old axiom, "A little learning is a dangerous thing."

No real knowledge is too elementary, and each acquisition creates a desire for more, but information is not knowledge, and, therefore, the value and necessity of self proof and demonstration, which are the true gauges of knowledge and science, science being knowledge reduced to a system.

The value of investigation and research is no better demonstrated than by the work of the already referred to chemists who in ancient times believed in the existence of but four elements, earth, air, fire and water, and ridiculous as it now seems their conclusions were not entirely without logic, for in all of their investigations they found a recurrence of their supposed elements and every substance was supposed to contain all of these.

As a matter of instance, the heat of friction indicated the presence of latent fire; ash, the result of combustion, was believed to be earth; and the escaping gases as the additional result of combustion were looked upon as air; while the condensed products of combustion, from even previously dried substances, indicated the presence of water. The fallacy of this theory eventually became evident by gaps in the system, thus allowing for the filling in of new discoveries, which can often be foretold from gaps in any system, and without which the progress of the Nineteenth Century would have been impossible.

Improvements come slowly but surely, and the ability to take advantage of the opportunity is the evidence of the skilled engineer, and these opportunities are now more than ever before arising in the gas profession.

One of the most vital questions of the age is the production of a convenient, clean, safe, cheap, smokeless fuel, suitable for all uses, and surely no other known substance possesses all of these desirable qualities in so marked a degree as does gas. Thus is given to the engineer the task of solving one of the world's greatest economic problems, and the recognition of his valuable and appreciated services has come to stay. To what heights may it not attain.

The production of artificial light, necessary as it is, is of declining importance when compared with fuel, in addition to which the term fuel in the gas world is now synonomous with light as it is also with power, for does not a supply of proper gaseous fuel mean the rapid development of the all too long overlooked gas engine.

Gas engineering is an honorable, respected and recognized profession of standing and importance, and calls for a degree of skill second to none. It affords remuneration exceeding that of other engineering professions, but to be successful ability and application are requisite, and to gain this recognition gas engineers must adhere to their profession, keeping step with the drum beats of the Twentieth Century, and remembering that to humanity smokeless fuel is of much greater importance than smokeless powder.

The President introduced Mr. George C. Holberton, who read a paper on

ELECTRICALLY OPERATED APPLIANCES IN GAS AND ELECTRIC WORKS.

It would perhaps be well before starting to read this so-called paper to offer some explanation of why it was written, and an apology for calling such an aggregation of suggestions and questions by the dignified name of a "Paper."

A short time ago the writer suggested to Mr. E. C. Jones the use of

electrically operated valves in a plant that he was constructing, where it was desirable to open one and shut another of two valves at the same time, and where it was not convenient to locate them in such a position that one man could reach both at the same time; also, they were suggested, as the operation could have been made automatic, the time of the opening and closing of the valves depending on the height of two gasholders which acted as positive output meters.

Mr. Jones was so interested in the action of these valves and the methods used to insure positive action, and the tests to which they had been subjected, that he suggested I give an explanation of their construction and operation to this Association, as he thought there were many difficult problems that might be solved by their use.

In his experience in building and operating electric works the writer has found many other tools and auxiliaries that can best be operated by electric motors, and a number of them are suggested later on in this paper.

A few years ago electricity was looked upon as an enemy of the gas man, and gas men generally were united in their endeavor to fight a supposed "common enemy." At that time and even now there seems to have existed in the minds of many gas men a prejudice against the use of anything electrical around a gas works. Then, too, in former years the gas company and the electric company were separate concerns, working in opposition to each other; but now all this seems to have been altered, and in the interest of economy and shutting out opposition, nearly all the companies operating in each city and town have been consolidated, or else where independent companies exist, they operate both gas and electric works. This places electricity in the hands of the gas man, and gas in the hands of the electric man, to be used according to their relative merits in each case, and I trust all prejudice will in future be cast aside and both be used with equal freedom to further the ends we are all seeking.

There are a few, and I have good reason to believe there will be more, large gas works that are simply manufacturers of gas and not distributers who sell their product at wholesale to the local distributing company. This latter class have not electricity at their command in the same sense as have the combined gas and electric companies, but I honestly believe that it would pay them to purchase electricity for certain classes of light and power work, or else have an electric plant of their own for that purpose.

To give an instance of this, a few days ago I was discussing the subject of a water supply with those interested in such a gas manufacturing plant, and circumstances seemed to show that the greatest amount of water could be procured by sinking wells at some distance from the works. Then came the question of how are we to get our steam there for the pumps. Use electricity and operate your pumps by motors, I suggested; but we have our steam for nothing said my friends. That is to say, we have any amount of waste material in the nature of a bye product which can only be used as fuel.

Personally, I do not believe there is any fuel so cheap that you can afford to waste it; by wasting it I mean utilizing the power which it represents in any but the most economical way, then if any remains sell it to some neighboring power plant for use under their boilers, and if this is impossible, due to the nature of the material, convert it all into electrical energy and sell them what you cannot utilize yourself.

So far nearly all my remarks have been such as to recommend the use of electricity about the works as a matter of convenience, ease of application, etc. In addition to this there is in many instances a fine chance at increased economy. Take, for example, the wells just referred to, where the steam lines would be very long and the pumps small, taking steam nearly the whole stroke and operating disadvantageously—and I have actually known of such combinations taking from 80 to 100 pounds of steam per horse power hour—whereas, a motor of the size that would probably be used would have an efficiency of over 85 per cent., and the dynamo from which it received current would have an efficiency of maybe 90 per cent., so that the corresponding steam consumption of an electrically operated pump would be from 20 to 30 pounds, according to the character of the plant from which the electric current was obtained.

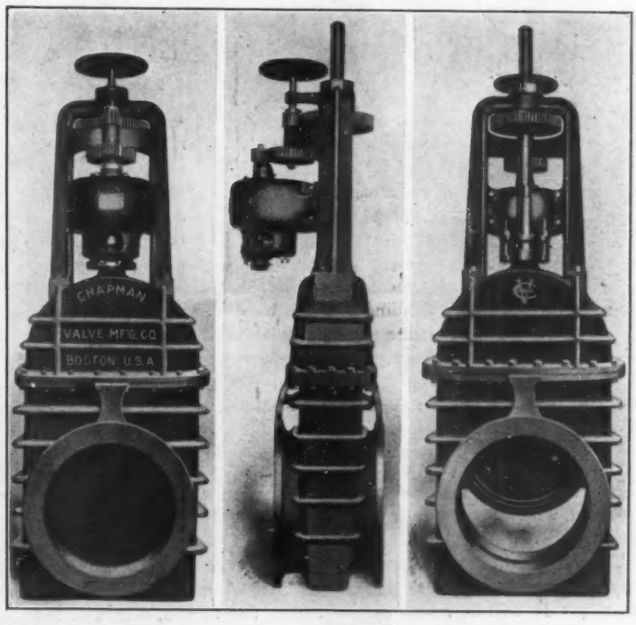
A fine sample of what can be done with "so-called waste" fuel is found in the operation of the large rice mills in Siam, where the writer spent some time a few years ago.

A short time ago it was the practice to buy cordwood to operate the mills. The shell which was taken off the rice was carried away from the mills by coolies and burned up in huge piles on the vacant land behind the mills, or else carried away in boats and dumped. Finally someone smarter than the rest found that this husk or shell could be burned under the boilers in place of wood. Then they stopped buying wood and used this husk for fuel, but still had a large amount left over. Then others began to use it, and in place of loading it on boats and giving it away, the rice mills began to charge for loading it, then they began to charge for the "paddy husk" itself. All this time they were burning it in the most extravagant manner and used the steam in simple non-condensing engines. Then they found they got such a revenue from the sale of the husk in opposition to firewood, which had to be transported a long way, that they put in compound condensing engines and improved their furnaces so as to save all they could, and now the income from the sale of the "paddy husk" constitutes an important factor in the price of milled rice; and I firmly believe that the same benefits would accrue to the larger gas works by more economically utilizing the waste products from the manufacture of gas and selling the remainder either as fuel or in the form of electric power.

With the successful manufacture of gas direct from cheap California crude oil, the fuel item becomes a smaller percentage of the cost, and we must look in other directions to cut down the cost. Here then comes another opportunity for the electric motor to shine, in minimizing labor. Think of the time that could be saved by operating a few of the more important valves from a switchboard placed near the main generators. This applies equally well to the starting and stopping of many of the auxilliaries about both gas and electric works, if same are motor driven. In fact, all the advantages of electric drive that apply to manufacturing establishments, and which have been too well demonstrated to dwell further on here, apply equally well to gas and electric works, so I will close with a description of some of those applications that are particularly fitted to our requirements, together with some illustrations of the electrically driven valves and other appliances.

So far as the writer knows the suggestion of developing a line of electric motor driven valves came from Mr. Fred. E. Kimball, of the General Electric Company, to Mr. Henry Dalton, Jr., of the Chapman Valve Company. A great deal of time has been spent developing these valves as there were many obstacles to be overcome.

Figs. 1 to 3 show the general appearance of the valves. You will

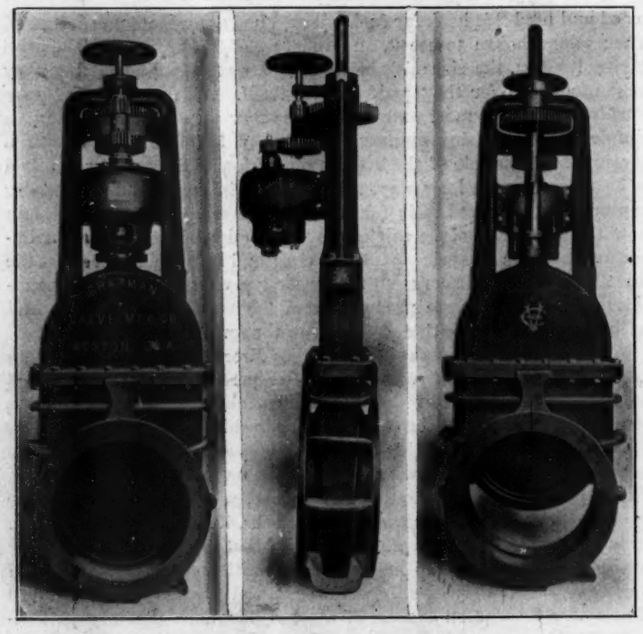


Front View. Electrically Operated Valve. | Edge View. Electrically Operated Valve. | Back View. Electrically Operated Valve.

Fig. 1.

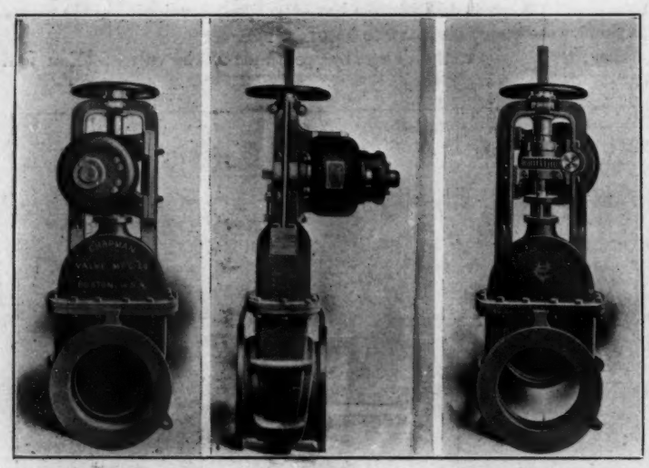
note that the motor is mounted on the yoke. At first the motors were mounted on the bonnet, but it was thought that by mounting on the yoke it would be possible, without great expense, to change existing valves to electrically driven valves by substituting a new yoke and spindle.

Fig. 5 shows a 12-inch valve, which is intended for high pressure water service. This valve is operated through 3 sets of gearing, making the gate travel very slow to prevent water-hammer. The motors used to operate these valves are special series wound motors, having a very large starting torque. In general practice when the valve reaches its limit of travel the motor comes to a standstill without opening the



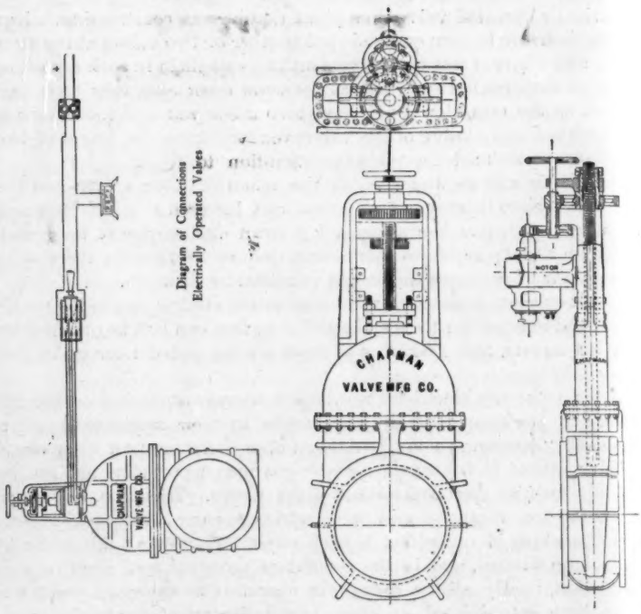
Front View. Electrically Operated Valve | Edge View. Electrically Operated Valve. | Back View. Electrically Operated Valve.

Fig. 2.



Front View. Electrically Operated Valve. | Edge View. Electrically Operated Valve. | Back View. Electrically Operated Valve.

Fig. 3.



PLAN FRONT AND SIDE VIEW Electrically Operated Valve

Fig. 4.

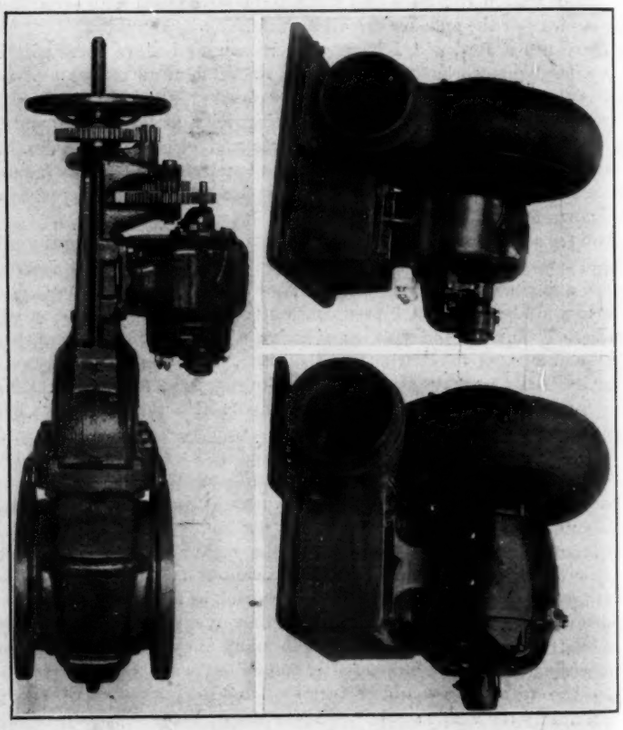


Fig. 5. Fig. 6.

electrical circuit. If it is desired, however, an automatic device can be inserted which opens the circuit when the valve is entirely opened or shut.

The manufacturers of these motors guarantee them to stand still for 30 minutes, with full current through their windings without injurious heating. It will be noted by inspecting the wiring diagram, Fig. 4, that there is a permanent resistance in series with the motor which limits this current to a certain predetermined amount, which amount is enough to give sufficient torque to start the valve from rest. To give some idea of what these motors will do, I would say that one of the tests to which these valves were subjected was to freeze the gates tight in the seats by rusting and allowing to stand. No difficulty was experienced in opening the valves even under such a severe condition.

The valves are coming into general use in the East in the large steam plants now being built. Anyone of us who has had the delightful experience of being in a room when a large high pressure steam main broke will realize the difficulty of getting at the valves to shut them off. With the electrically operated valves, however, the switches are placed in the chief engineer's bridge and the valves operated from there. I was promised a photograph of the chief engineer's bridge in the Boston Edison Station, showing these switches and valve operating mechanisms, but so far same has not arrived.

In addition to so placing these valves so as to isolate certain sections of the steam mains in case of trouble they are used in connection with the main throttle to the engines so as to be closed from a distance, in case of a serious accident to an engine.

There are now being placed eight 30-inch valves of this character in the new King's Bridge Station of the Third Avenue Railroad in New York. They are also used in a number of other large Eastern plants.

I hope that a discussion of this paper by those who are more familiar with gas works operation will suggest some uses for these valves about the gas works which will be found beneficial, both from a standpoint of convenience and safety and as an economizer of labor.

I had intended to go into a description of the construction and application of a number of other appliances which might be used about the gas works, but I find that the paper is growing too long and would probably only bore you, so I merely append some illustrations of appliances showing convenient methods of connecting the electric drive to the apparatus, and trust that among them you will find at least one which will prove of value to some of you.

I would particularly call your attention to Fig. 6, which shows a blower, direct-connected to an electric motor. I believe that this is one of the places where an electric motor can be used to much better advantage, in both convenience of starting and stopping and in economy, than the steam engine. Also, in this connection I would suggest the use of a motor driven exhauster to draw your air through the purifiers in place of the steam jet exhauster.

We are using in our electric light works in Oakland the portable drill shown in Fig. 7, and find it the greatest possible convenience.

We drill with this up to 2-inch. There are three spindles on the outfit, each having a different speed. The motor is 2-horse power. The eye-bolt in the top is so placed that the whole apparatus is perfectly balanced and can be picked up by a crane and operated while suspended in the air.

Fig. 8 shows a convenient rig for blue printing during cloudy days or

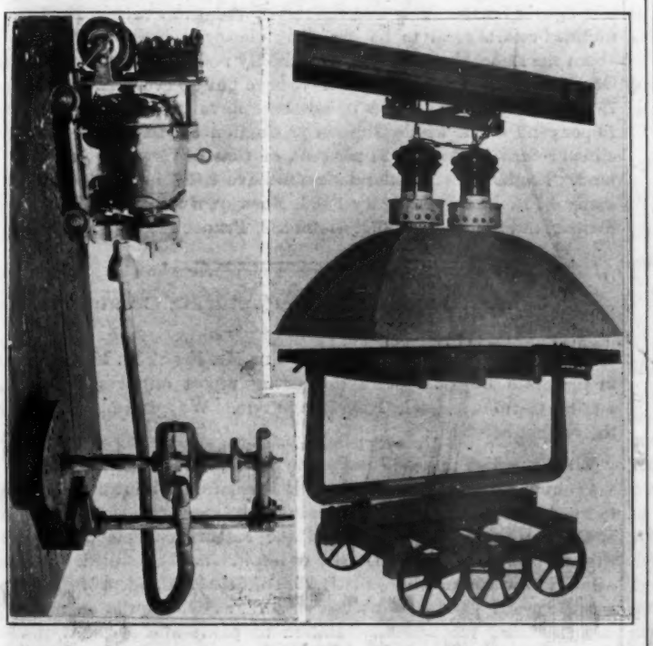


Fig. 7. Fig 8.

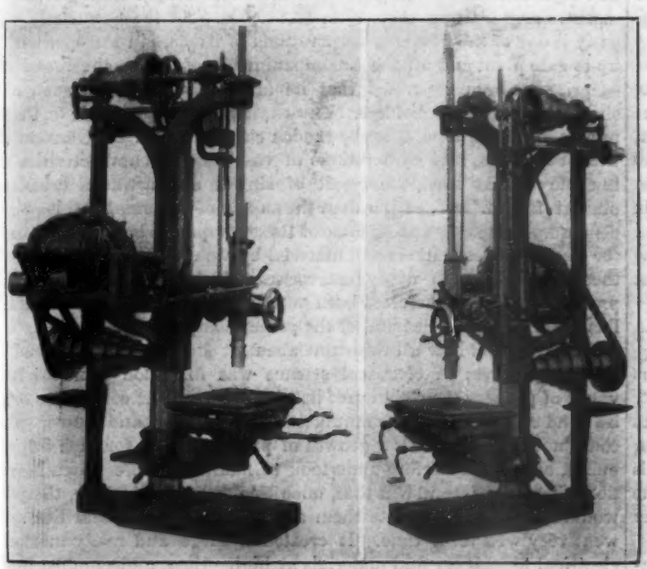


Fig. 9.

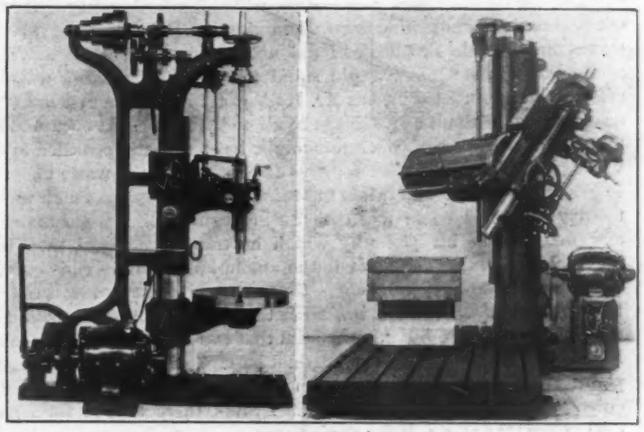


Fig. 10.

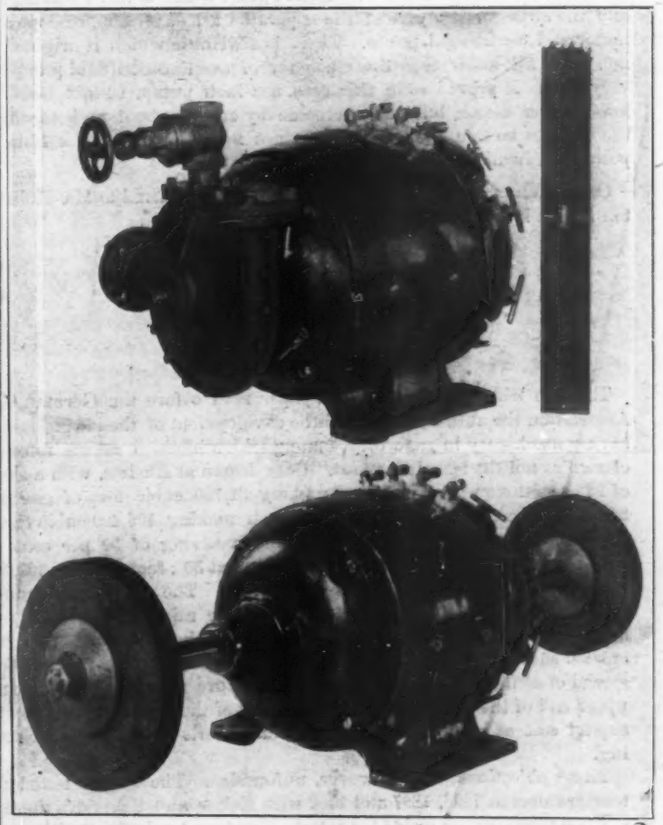


Fig. 11.

at night, consisting of two standard inclosed arc lamps with a special hood over the blue printing frame. The balance of the figures are self-explanatory.

Aside from all the considerations above mentioned, there is a great benefit accruing from the use of these electric appliances, as a means of advertising where a station desires to exploit its motor business which, as an element in the improvement of your power factor and a builder up of your day load, is a very important and profitable branch of your business. We have in Oakland about 1,500-horse power in motors, ranging from 1/30 to 150-horse power connected to our power circuit. These motors are used for every conceivable purpose, and show what can be done in this line by a little free education on the part of the companies.

Discussion.

Mr. Jones—Respecting the gist of Mr. Holberton's excellent paper, I want to say that the uses of electricity in gas works must not be underestimated, and they are growing daily. In several of our plants we have electrically driven blowers for water gas sets, and electricity is

valuable for lighting purifying houses, where it affords safety that cannot be obtained by any other form of illumination. For handling valves I was at first a little skeptical. I did not see how a delicate machine such as an electric motor could stand the strain of starting a valve after it had been rusted in, but Mr. Holberton informs me that has been accomplished without any damage at all to the motor. It occurs to me that the stack valves of generators might be electrically operated to advantage. What Mr. Holberton says about the value of waste material in gas works is true, and if it is not recognized by every gas man to-day the day will soon come when he must recognize it. If a gas man has any material in his plant by which he can make steam, then that material has a value according to the amount of steam he can generate with it. If it be coke screenings the gas man must not waste it. I know instances where land was made that has been filled in with coke and coke screenings, but any material that can be converted into steam has its value, and if that steam cannot be used direct as steam for propelling engines then the steam can be converted into electricity and either sold or used about the plant. I think there is food for a good deal of thought in Mr. Holberton's paper.

Mr. Osborn I saw quite a novel little water works in San Rafael. The city is doing its own pumping of salt water for sprinkling the streets. It works with an automatic switch which is thrown at night, and the switch takes care of the apparatus all day—a 2-horse power motor and centrifugal pump. There is a wrinkle which is original to me. We all know that the efficiency of small centrifugal pumps is very low. It proved so in this case, a 2-inch pump, 60-foot head, 2-horse power motor, but was overcome by cutting about an inch off of the runners so that the capacity was not more than that of a 1¼-inch pump. It furnished, however, plenty of water.

On motion of Mr. Papst a vote of thanks was tendered to Mr. Holberton for his interesting paper.

[To be Continued.]

Inclined Retorts.

By Herr E. Merz, Cassel.

The *Gas World* reports that in a paper read before the German Gas Association the author first traced the development of the idea of labor-saving machinery in gas works, among which inclined retorts must be classed as not the least important. Coze began at Rheims, with a slope of 29°, the three retorts he used making 31,780 cubic feet of gas per 24 hours. In 1887 he had a 9-retort bench making 106,420 cubic feet a day with only 16.74 per cent. of fuel and a saving of 30 per cent in wages. In 1890 he had two 9-retort benches at 30°, each making 109,500 cubic feet a day with 13.33 per cent. of fuel. The results were much criticised, and the following objections were raised: Impossibility of maintaining uniform heats, the pressure upon the front wall, the anticipated short life of the retorts and difficulty of repairs, the uniform spread of coal in the retorts, the great pressure and small yield at the upper end of the retort, the inferior quality of the gas, and the greater capital cost as compared with horizontal retorts and machine charging.

These objections were, however, unfounded. The author tested the temperatures in 1896, 1897 and 1902 with Keiser and Schmidt's thermo-electric thermometer inside the retorts, and found only 40° C. difference between the highest and lowest temperature. This is insignificant at temperatures between 1,000° and 1,100° C. The coke came in Cassel to 13.5 to 15 per cent. of the coal distilled, in Heilbronn to 16 per cent., in Mulhausen to 13 to 14 per cent., in England generally from 12.12 to 14 per cent. These results are not inferior to those of the best generator benches. As to pressure on the front wall, this was dealt with by Hasse in 1892. No case seems to have occurred of any mischief having arisen from this cause.

As to the life of the retorts, this is as good as that of other kinds. In the author's experience they have lasted from 969 to 1,431 days; average 1,232. There is no trouble in repairing retorts of continental lengths (11 feet 6 inches to 16 feet 5 inches), and even in England, with retorts of 20 feet, they do not appear to have had much. The author approves of the continental form, elliptical section, expanding a little downwards; charging at 32° or 33° and raking out have very little effect upon this form. More recently a form has come in in which the upper half of the flat ellipse is somewhat dilated, so as to allow scope for swelling of the coal, and the bottom is made somewhat flatter, but not flat.

As to the spread of coal in the retorts, this is fairly automatic, but undoubtedly the discharge is better when the retort is new and smooth, or has been freshly cleaned out, and later on the discharge of coke must be helped; but it is in any case safer for the workman to take the coke out than to have it all shot out at a run. The workmen soon learn how to shoot the coal in according to the size of it, so that in the end the coke ultimately produced comes to form a uniform layer in the retort.

As to the alleged higher pressure and poorer yield at the upper end of the retort, actual measurements do not bear this out to any material extent. The data are much the same as in horizontal retorts, both in respect of pressures and of yield. It would be difficult to pick out from a list of analyses or of heating values [tables given] the gas works which use inclined retorts and those which use horizontals.

The wages per 1,000 cubic feet of gas run closely parallel with the English rates; the English use larger retorts, but the advantage of these is as nearly as possible balanced by their higher wages. All who use inclined retorts seem agreed that they get the maximum yields with the least ground areas, and that the labor required need not be specially skilled or powerful, so that a more ordinary class of workman can do the work. Inclined retorts are better, too, for the men; the retort houses are loftier and there is therefore better air and light; and the work is not so exhausting, and the men are not so much exposed to heat during discharging, and the steam goes up alongside the hot ascending pipe out of their way.

As to the capital cost, the author has not been able to obtain comparative figures for Germany and the rest of the continent; in England the inclined retorts seem to be distinctly cheaper. Even if the costs ran about the same, the advantages distinctly rest with the inclined retorts. Of recent years inclined retorts have been put up everywhere; and some 75 to 80 per cent. of all now in existence have been put up since 1898. 70 per cent. of the whole German production of gas is now made in inclined retorts, and about 24 per cent. of that of Great Britain and Ireland. England and Scotland seem to have 8,087 inclined retorts, Germany 4,734, Austro-Hungary 1,804, Norway, Sweden and Demark 701, Switzerland 522, Italy 378, Holland 333, France 220 and Spain 180.

General Electrical Manufacturing Conditions.

The U. S. Consul-General at Berlin, Mr. Frank H. Mason, has sent to the State Department an interesting report on present conditions among German electrical manufacturers. We give his discussion of the subject herewith:

What is called in headlines by the German press "The catastrophe in the Schuckert Electrical Company," has recalled public attention sharply to the conditions under which some of the great electrical corporations of Germany were promoted, and the embarrassments which some of the methods employed have more or less inevitably entailed. The event alluded to was a meeting on July 26th of the stockholders of the Schuckert Electrical Company at Nuremberg, at which the managers announced that, through depreciation of plant and material, insolvent accounts, and necessary appropriations for a reserve fund to meet further depreciations, the company had suffered losses aggregating 15,500,000 marks, or something more than $3,500,000. As the Schuckert Company is one of the foremost corporations of its class in Europe, with an up-to-date plant and all the accompaniments of a large business, some surprise has been expressed that its affairs should make such a bad showing for its shareholders. The explanation leads back to the fact now well known here, that the sudden rise of some of the German electrical companies into corporations of vast resources and activities was, in some cases at least, the result of skilful and artificial creation of markets for products, rather than the supply of an actual and legitimate demand. Concisely stated, some of these companies bought their orders for electrical installations and material by financial operations that left them shareholders in many enterprises which have since proven less promptly lucrative than had been hoped, and have thus drawn more or less heavily upon the capital of the parent companies.

To understand how all this came about, it should be remembered that German progress in electrical science was for a long time far in advance of popular appreciation of its advantages. The companies organized and equipped for the manufacture of lighting and power plants could not wait for the slow growth of public demand for such improvements, and they therefore undertook to finance and erect such installations themselves, confident that, once established and in use, the public would not fail to appreciate them and invest in their securities. This went very well for a time. It created a large and ready market for electrical machinery and materials at high prices, and supplied hesitating municipalities with electric tramways and lighting plants which

their citizens greatly enjoyed, but which were built and for a time managed by the electrical manufacturing companies at their own expense. Inevitably, this process of consuming their own capital necessitated heavy loans and frequent increases in the stock of such corporations, together with a steady expansion of their manufacturing capacity. Some of the companies, especially the Schuckert, made enormous investments in electric installations for the manufacture of calcium carbide, putting in the machinery at their own prices, but receiving for it little or nothing except stock in the carbide plants. Thus the supply of acetylene material was soon far beyond all legitimate requirements, prices collapsed, and the carbide industry suffered a serious and permanent reverse.

Another heavy blow for some of the German electrical manufacturing companies has been the failure of storage-battery traction for tramways. When electric traction was introduced into this country, municipal governments were timid and hesitating. They objected to the overhead conductor because it was considered unsightly and dangerous, and in order to obtain any franchise at all the tramway companies and the electrical manufacturers who were behind them had to agree to furnish cars that would dispense with a visible trolley. This meant either the underground-conduit system—which is so expensive to construct as to be justified only by an enormous traffic—or a reliance upon storage batteries, and the companies generally had recourse to the latter. The extent to which this has been done may be inferred from the fact that one company in Hanover has at present 274 accumulator cars in service. There, as at Halle, Hagen, and many other places, they have been found so heavy and costly as to be unremunerative. At Berlin, where many hundreds of them have been in service, all are to be abandoned and recourse had to underground conductors for centrally located streets and overhead wires for the less crowded and suburban sections.

The net result of all these conditions was that some of the electrical manufacturing companies of Germany, which had gone on organizing and supplying power, lighting, carbide, and other plants, not only at home but in Russia, Scandinavia, Austria-Hungary, and other European countries, were caught with all sail spread by the turning tide and adverse gale that set in during the summer of 1900. In the stormy weather that ensued, most industrial stocks declined sharply, the investing public became alarmed and timid, the failures of the Leipziger and other banks followed a few months later, and led on to the situation of which the meeting of last week at Nuremberg has been the ultimate result.

The encouraging features of the present condition are the fact that the credit of several of the oldest and strongest of the electrical companies remains unshaken, the general feeling that the bottom has been reached, that the obligations entailed by a system of forced development have been mostly liquidated, and that with the good cereal crops that will be harvested this year, peace throughout the world and the hoped-for renewal of the commercial treaties which are to lapse next year, the foundation will be laid for a renewed and enduring prosperity.

Moving Exhibits in the Department of Manufactures, Universal Exposition, St. Louis [illegible].

While reserving the right to charge for power when thought best, the St. Louis Exposition Administration is prepared to furnish it free, as well as light and such other facilities as may seem reasonably necessary for the best presentation and operation of a desirable exhibit. This liberal policy has been inaugurated to encourage the installation of moving exhibits and because this class of installations is the most instructive as well as the most interesting—instructiveness and attractiveness being two of the most important items in a modern World's Fair.

It is not therefore the idea, so much, simply to fill the buildings in the Department of Manufactures with exhibits, as to have those exhibits which are accepted, sufficiently interesting and instructive to insure the attention of the public and the consequent proper returns to the exhibitor. This can only be the result when the exhibits appeal with sufficient force to the multitude as well as the specialists that pass up and down the aisles of the exposition palaces to hold their admiration or their interest.

There is probably no method of exhibit so far reaching in its benefits to the manufacturer as that which employs operating machinery or introduces motion in some manner, and it is for this reason that the exposition authorities are prepared to do everything possible to aid exhibitors in making installations of this character.

One need but remember the crowds that collect on a busy thoroughfare to inspect the simple operations of an automatic novelty to have a good example of the value of movement in an exhibit. When it is considered that an operative exhibit in an exposition demonstrates some new, interesting and instructive process, it will be readily seen how much greater will be the interest taken and how much greater the benefit secured.

All the important exhibitors of record so far in the Department of Manufactures of the St. Louis Exposition have applied for space in which to place moving machinery and those exhibitors who are yet to make their requests for space should study carefully some means of utilizing a few, at least, of the processes of the manufacture of their goods as part of their installations or arrange to employ motion in some way in order to get the most out of their exhibits at the Exposition.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

AT the annual meeting of the shareholders in the Malden and Melrose (Mass.) Gas Light Company, the following officers were elected: Directors, F. E. Chandler, E. A. Hildreth, R. R. Robinson, S. E. Benson, E. O. Holmes, V. W. Mason, E. J. Stevens and E. N Foss; President, F. E. Chandler; Treasurer, C. E. Dolley; Clerk, V. W. Mason.

WE understand that Mr. Bankson Taylor, has resigned the positions of Local Manager and Purchasing Agent to the New Orleans (La.) Lighting Company. His successor is Col. Joseph H. De Grange, Vice-President of the New Orleans Railways Company.

AT the annual meeting of the Welsbach Light Oompany the Directors chosen were: Sidney Mason, B. W. Spencer, Thomas Dolan, Samuel T. Bodine, Randal Morgan, Walton Clark, W. W. Gibbs and Lewis Lillie.

THE authorities of the village of East Grand Rapids, Mich., have granted a franchise for the distribution there of gas for illuminating and other uses to the Grand Rapids Gas Light Company. It is agreed that the service shall be commenced on or before June 1, 1903.

THE Oakland (Cal.) Gas, Light and Heat Company reports largely increased business, mainly on fuel account.

AT the annual meeting of the Woonsocket (R. I.) Gas Company the Directors elected were: E. A. Mongeon, Dennis D. Farnum, George M. Welles, Warren A. Cook, Chas. H. Darling, Edwin Aldrich and John W. Ellis.

THE Union Gas and Electric Company, of Bloomington, Ills., has arranged for the construction of a handsome modern office building on the site recently purchased by it on North Main street.

THE proprietors of the Sandusky (O.) Gas and Electric Company have authorized Superintendent Blin to cause the removal of the double meter system. This order is the result of the determination of the Company to accept the ordinance which obliges it to sell gas on lighting and fuel accounts at the uniform rate of 80 cents per 1,000 cubic feet. Hitherto the rates were: On lighting account, $1.25; for fuel use, 80 cents. The new schedule seems a decidedly harsh one; but, as our informant adds, "To those in the know it may be taken for granted that the Sandusky Company was between the devil and the deep sea when the terms of the ordinance were proposed. However, although the price is beyond doubt below that which could be considered fair to the Company, I think oue would be on the safe side in declaring that the interest on its bonds is in no danger of default." Let us hope so.

THE new generator plant recently installed by the California Central Gas and Electric Company at its Fresno (Cal.) station is in satisfactory working order. It is of the Lowe type, and crude oil is the enricher used. On and after October 1st the selling rate at Fresno will be put at $2 per 1,000 cubic feet gross, less 50 cents per 1,000 for prompt payment, which means any time within 10 days after the bills have been received.

MESSRS. HOYT AND MILLER are now in complete ownership and possession of the properties of the San Luis Obispo (Cal.) Gas Company. The plant will be rebuilt and the selling rate will be reduced to $1.50. The old rate was $3.50.

JUDGE COLT, in the United States Circuit Court, recently entered up a decree authorizing the foreclosure of the mortgage upon the property and franchises of the New England Gas and Coke Company, which is held by the Central Trust Company of New York as trustee to secure the Gas and Coke Company's bondholders. The decree was entered in the cases of the United Gas and Coke Company vs. H. M. Whitney et al., trustees, and the Central Trust Company of New York vs. the same, in which R. M. Burnett was appointed receiver of the New England Company's property several weeks ago because of the latter Company having defaulted in the payment of its outstanding bonds, amounting to $16,862,000. The total amount of the bonds, with accrued interest, is $17,089,168.61. The decree provides that no bid for less than $10,000,000 shall be accepted; that no one shall be allowed to bid unless he shall have deposited $100,000 in cash or $200,000 in bonds, and that the successful bidder shall pay $400,000 forthwith. The property consists of several parcels of land in Everett and Chelsea; a 25-year contract with the Dominion Coal Company, Ltd., dated September 30, 1897, under which the New England Company has the right to purchase for 25 years slack coal upon certain terms and conditions; an exclusive license or contract with the Otto Coke and Chemical Company to construct and operate for New England retort ovens; 10,000 shares of the Massachusetts Pipe Line Gas Company stock of the par value of $100 each; $1,000,000 certificates of indebtedness of the Brookline Gas Light Company, dated February 1, 1898, and February 1, 1900; demand notes of the latter Company amounting to about $112,000; demand notes of the Massachusetts Pipe Line Gas Company amounting to about $1,000,000, and $1,000,000 par value of Boston United Gas Company bonds, first series, as well as cash received by the receiver. Under the decree the transferee of the contract between the Dominion Coal Company and the New England Gas and Coke Company becomes bound by the acceptance of the transfer and conveyance to assume and perform all the covenants and agreements on the part of the New England Gas and Coke Company contained in that contract. The funds arising from the sale are to be applied, first, to the payment of the expenses of the sale and the cost of the court proceedings, and it is provided that the Court reserve the question whether the receiver's certificates shall be given priority over the rights of the bondholders. The residue shall be applied to the payment of the principal and interest of the bonds. If the amount realized by the sale is insufficient to pay the par value principal of the bonds, the money is to be applied pro rata for the payment of the same. If the amount realized is more than sufficient, then the proceeds shall be applied toward the payment of the principal of the bonds and then for the pro rata payment of interest thereon as represented by the outstanding coupons maturing June 1, 1902. Any surplus left is to be applied as the Court shall hereafter order.

IT is reported that Mr. Clarence P. King, of Philadelphia, President of the Pottsville (Pa.) Union Traction Company has secured a controlling interest in the Pottsville Gas Company. The works will be rebuilt.

THE Louisville (Ky.) Gas Company is now comfortably placed in its new offices at 829 Fourth avenue.

EX-SENATOR WILLIAM E. MILLER has been appointed Manager of the Peoples Natural and Artificial Gas Company, an opposition concern which is proposing to do business in Newark, O.

THE franchise of the Baraboo (Wis.) Gas and Electric Light Company has been renewed for a period of 25 years. It is likely that the interests of the Strong family in the Baraboo Company, which have been dominant therein for several years, are about to be sold to Chicago capitalists, who will rebuild the works.

THE voters of Gilroy, Cal., will soon be called upon to decide whether or not the plant of the local Gas Company shall be taken over for operation on municipal account.

THE offices of the Meridian (Miss.) Gas Light Company have been removed to suitable rooms in the Meridian National Bank Building, a change that will be appreciated by the Company's customers and its office force as well.

MR. GEORGE S. PORTER, JR., has resigned the position of Secretary and Treasurer to the Pacific Stove Company, of San Francisco and Los Angeles, Cal., in order to take charge of the affairs of the Gas Company that is to be forthwith constructed at Prescott, Ariz.

ON and after the 1st prox., the selling rates for gas supplied by the Tacoma (Wash.) Gas and Electric Light Company will be on the following basis: On illuminating account, $1.85 per 1,000 cubic feet; for fuel use, $1.60 per 1,000. Prompt payment (within 10 days) will entitle the consumers to a rebate of 5 per cent.

"W. S.," WRITING to the JOURNAL under date of the 13th inst., says that the properties of the Xenia Gas Company and of the Xenia Electric Light Company have been purchased by Chicago capitalists who have decided to merge both concerns under the title of the Peoples Gas and Electric Light Company. The gas plant will be rebuilt, which change should have been made long ago.

THE Morristown (N. J.) Gas Company is extending its main system to the outlying district of Mount Tabor.

THE plant of the Mount Holly (N. J.) Company will be shut down by December 1st. The residents of the named place will obtain their supply from the main pipe line between Trenton and Camden, which hooks up all the gas plants along the East side of the Delaware river that are under the control of the South Jersey Gas, Electric and Traction Company.

ADVICES from Staunton, Va., dated the 7th inst., are to this effect: "The purchase, by Mr. E. M. Funkhouser and his associates, of the Staunton Light and Power Company, has been announced. As this syndicate had already acquired the properties of the Staunton Gas Company, they now have complete control of the gas, electric lighting and street railway systems of the city."

MR. CORNELIUS FITZGERALD has resigned the position of Manager to the Orange County Gas and Electric Company, of Middletown, N. Y.

THE Sparta (Ills.) Gas and Electric Company have been incorporated by Messrs. A. M. Barker, L. L. Sexton and L. W. Barker.

UNDER the franchise granted to the projectors of the gas plant for Prescott, Ariz., it is stipulated that the life of the Company is to be for 50 years, that the selling rate shall not exceed $2.50 per 1,000 cubic feet, and that construction work shall be underway within a year from the date of the signing of the grant. It is also stipulated that the city shall have for public use 10,000 cubic feet of gas without charge, the excess over the same quantity used per month to be paid for at the rate of $1.25 per 1,000 cubic feet.

AT the annual meeting of the Seattle (Wash.) Gas and Electric Company the officers elected were: Directors, Samuel Hill, James G. Goldsmith, E F. Wells, H. C. Henry and J. D. Farrell. President, Samuel Hill; Vice-President, J. D. Farrell; Secretary and Treasurer, E. F. Wells; Assistant Secretary and Treasurer, E. L. Kellogg.

THE properties of the Citizens Gas Company, of Quincy, Mass., have been formally taken over by their recent purchasers, who are also largely, in fact dominantly, interested in the plants at Haverhill and Amesbury, Mass.

AT the annual meeting of the South Hadley (Mass.) Gas Company the officers chosen were: Directors, A. L. Wright, C. A. Gridley, L. W. Gaylord, H. S. Dunklee, and N. E. Preston; Clerk, Geo. W. Hubbard; Auditor, M. L. Welcker. It was also voted to change the time of annual meeting from the second Tuesday of September to the second Tuesday of July.

MR. RALPH WOODWARD, General Manager of the Pittsfield (Mass.) Coal Gas Company, reports that 700 appliances for the use of gas on other than illuminating account have been placed this season. Other good work done during the season was the placing of about 8 miles of additional mains, and Woodward is now placing a pipe extension to the outlying town of Dalton. It is not likely, however, that Dalton will be hooked up before next May.

Electricity says that the General Electric Company has offered to furnish the city of Schenectady, N. Y., with a new electric fire engine. If the offer is accepted, this will be one of the first cities in the world to be equipped with an electric fire engine. The engine is to be 12 feet long, 30 inches wide and 30 inches high and will weigh about a ton. The engine will be provided with a cable that will allow it to be attached to a socket on a pole not more than 200 yards from the fire. The electric power thus received will be used to operate the pump, which has a capacity of 1,500 gallons a minute. The advantages of this engine are that it can be operated at less expense than a steam engine, requires but one horse to draw it and needs but one man to operate it.

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Notification Respecting Advertising.—Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co. 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, SEPTEMBER 22, 1902.

The Market for Gas Securities.

There was some lively trading in Consolidated gas during the week, and the general tendency of the market for it was toward higher prices. It opened to-day (Friday) at 224, sold up to 225½ and closed at 224 bid, offered at 225. The list showed sales of 2,600 shares for the day. There is a steady demand for city gas bonds of all classes.

Brooklyn Union was traded in slightly, and the net result of the dealings, which were decidedly erratic in the changes shown, is virtually nothing for the week. Peoples, of Chicago, was also active, and the shares show a gain of 1¾ points in the bid price for the week.

Lacledes, both common and preferred, are neglected, but the quotations for each class are on the increasing side.

Baltimore Consolidated is steady, which remark fairly well goes in connection with the general list.

United Gas Improvement Company's shares are 114¾ bid, and we repeat our suggestion of some weeks ago that this stock is an undoubted purchase.

The revamping or rejuvenation of the securities of the New England Gas and Coke Company is proceeding satisfactorily.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

SEPTEMBER 22.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	224	225
Central Union, Bonds, 5's	3,000,000	1,000	110	112
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	118	120
Metropolitan Bonds	658,000	.	108	112
Mutual	3,500,000	100	350	..
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co. .. Bonds, 5's	11,000,000	1,000	112⅛	113
Northern Union, Bonds, 5's.	1,250,000	1,000	108	110
New York and East River Bonds 1st 5's	3,500,000	1,000	112	113
" 1st Con. 5's	1,500,000		109	111
Richmond Co., Stl	348,650	50	100	..
" Bonds	100,000	1,000	103	
Standard	5,000,000	100	130	140
Preferred	5,000,000	100	150	160
Bonds, 1st Mortgage, 5's	1,500,000	1,000	115¼	118
Yonkers	299,650	500	130	
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	243	248
" " Bonds (5's)	15 000,000	1,000	119	119⅛
Bay State	50,000,000	50	1¾	2
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works	450,000	100	28	30
" 1st Mtg. 5's	500,000	1,000	93	96
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	10	12
" " Bonds, 5's	5,256,000	1,000	79	81
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000		
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co.	29,500,000	100	100½	101
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	101	101⅛
Columbus (O.) Gas Lt. & Heating Co	1,682,720	100	88¾	89¼
Preferred	3,026,500	100	167½	169
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore	11,000,000	100	74½	74¾
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000			112
Consolidated Gas Co. of N.J.	1,000,000	100	15	17
" Con. Mtg. 5's	880,000	1,000	85	87
Consolidated G. & E. Co.'s, Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co	4,825,500	50		89
" Prior Lien 5's	5,608,000	1,000	99½	100
Detroit Gas Co., 5's	862,000	1,000	77	79
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	34	38
Fort Wayne	2,000,000	..	.	.
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	245	265
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	70	80
" Bonds, 6's	2 650,000	..	103¾	104½
Jackson Gas Co	250,000	50	73	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	90	94
Preferred	2,500,000	100	102	108
Bonds	10,000,000	1,000	109½	110
Lafayette Gas Co., Ind	1,000,000	100		60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	112	120
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	107½	108¼
" 6 per cent. scrip, due 1910	100,000	25	25	27
Montreal, Canada	2,000,000	100	182	184¾
Newark, N. J., Con. Gas Co	6,000,000	..	56	58
Bonds, 6's	4,600,000		105	106¾
New Haven	1,000,000	25	300	325
Nashville Gas Lt. Co.	1,000,000	100	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	105¾	106⅞
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co.	2,150.000	50	88	
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000		87½	90
San Francisco, Cal.	10,000,000	100	48	49¼
St. Paul Gas Light Co	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	113½	115
General Mortgage, 5's	2,465,000	1,000	92	93
St. Joseph Gas Co. " 1st Mtg. 5's	751,000	1,000	95	96¼
Syracuse, N. Y.	1,975,000	100	20	..
Bonds	2,047 000	1,000	99½	100
Washington, D. C	2,600,000	20	366	377
First mortgage 6's	600,000	..	..	..
Western, Milwaukee. Bonds, 5's	4,000,000	..	109¼	110
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OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., Sept. 10, 1902.

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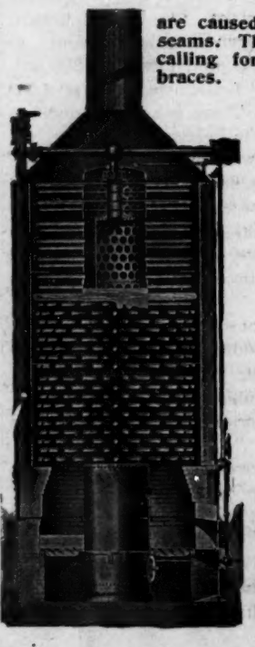

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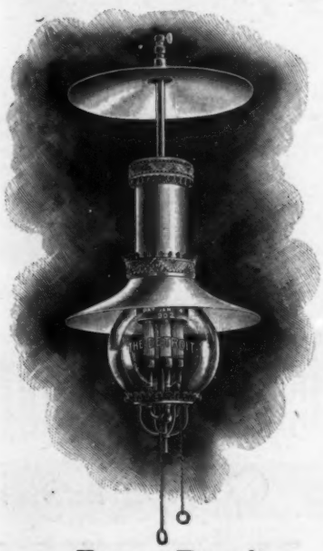

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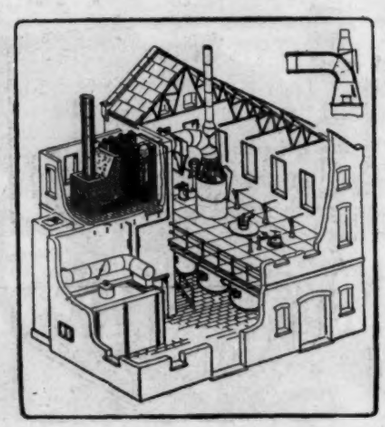

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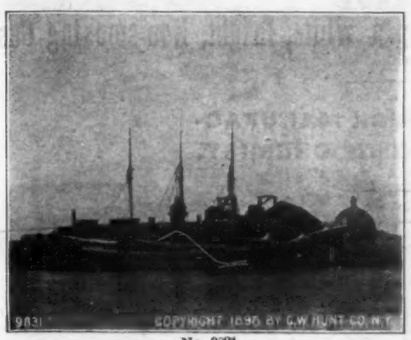

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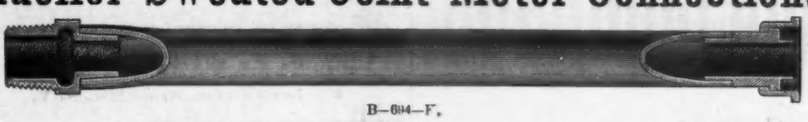

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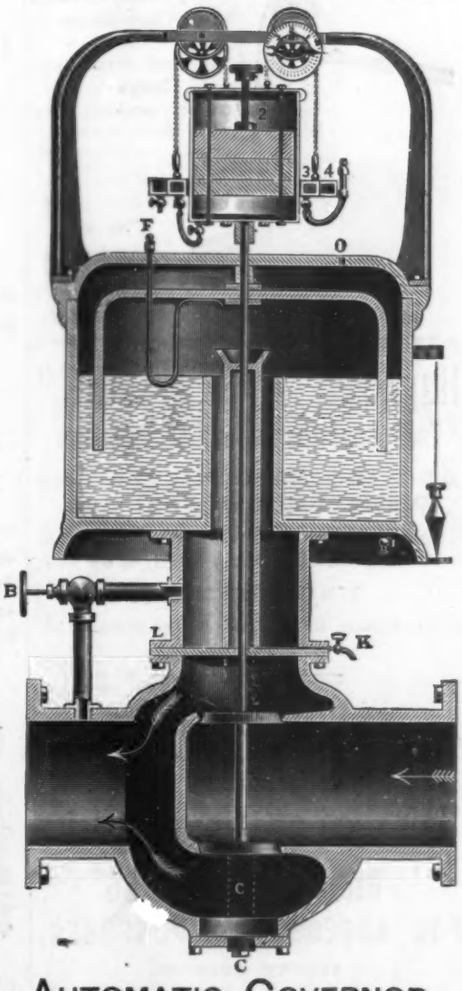

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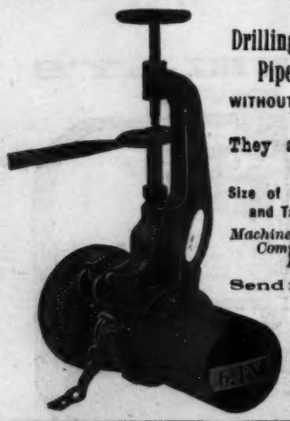

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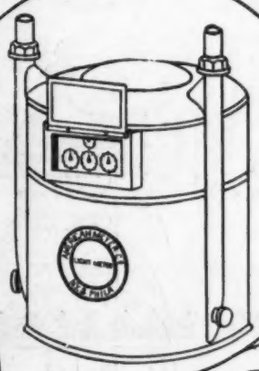

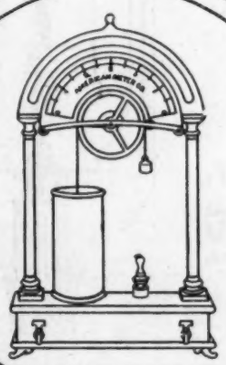

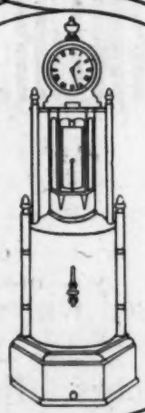

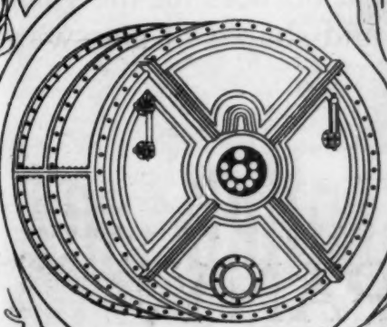

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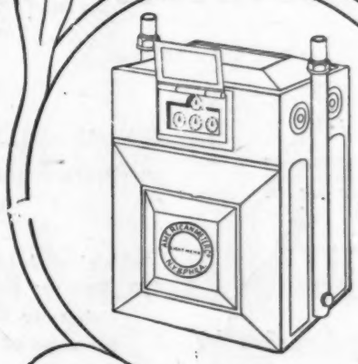
PUBLIC LIGHTING TABLE.

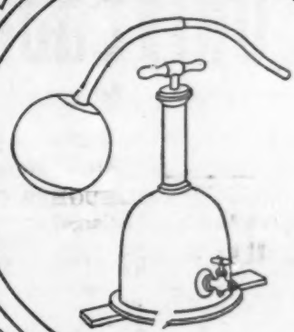
OCTOBER, 1902.

Day of Week.	Table No. 1. FOLLOWING THE MOON. Date.	Light.	Extinguish.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Light.	Extinguish.
				P.M.	A.M.
Wed.	1	6.10 PM	5.00 AM	5.30	5.00
Thu.	2	6.10	5.00	5.30	5.00
Fri.	3	6.10	5.00	5.30	5.00
Sat.	4	6.10	5.00	5.30	5.00
Sun.	5	6.10	5.00	5.30	5.00
Mon.	6	7.50	5.00	5.30	5.00
Tue.	7	8.30	5.00	5.30	5.00
Wed.	8	9.20	5.00	5.20	5.10
Thu.	9	10.20 FQ	5.00	5.20	5.10
Fri.	10	11.10	5.00	5.20	5.10
Sat.	11	12.10 AM	5.00	5.20	5.10
Sun.	12	1.10	5.10	5.20	5.10
Mon.	13	2.10	5.10	5.20	5.10
Tue.	14	3.20	5.10	5.20	5.10
Wed.	15	No L.	No L.	5.10	5.20
Thu.	16	No L. FM	No L.	5.10	5.20
Fri.	17	No L.	No L.	5.10	5.20
Sat.	18	5.40 PM	7.20 PM	5.10	5.20
Sun.	19	5.40	8.10	5.10	5.20
Mon.	20	5.40	9.10	5.10	5.20
Tue.	21	5.40	10.10	5.10	5.20
Wed.	22	5.40	11.10	5.00	5.30
Thu.	23	5.40 LQ	12.20 AM	5.00	5.30
Fri.	24	5.40	1.20	5.00	5.30
Sat.	25	5.40	2.30	5.00	5.30
Sun.	26	5.30	3.30	5.00	5.30
Mon.	27	5.30	5.30	5.00	5.30
Tue.	28	5.30	5.30	5.00	5.30
Wed.	29	5.30	5.30	4.45	5.35
Thu.	30	5.30 NM	5.30	4.45	5.35
Fri.	31	5.30	5.30	4.45	5.35

TOTAL HOURS LIGHTING DURING 1902.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	238.30	January	423.20
February	196.20	February	355.25
March	196.20	March	355.35
April	166.40	April	298.50
May	151.40	May	264.50
June	131.10	June	234.25
July	142.40	July	243.45
August	162.00	August	280.25
September	179.00	September	321.15
October	216.30	October	374.30
November	224.10	November	401.40
December	250.00	December	433.45
Total, yr.	2255.00	Total, yr.	3987.45





NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 624 Tremont Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

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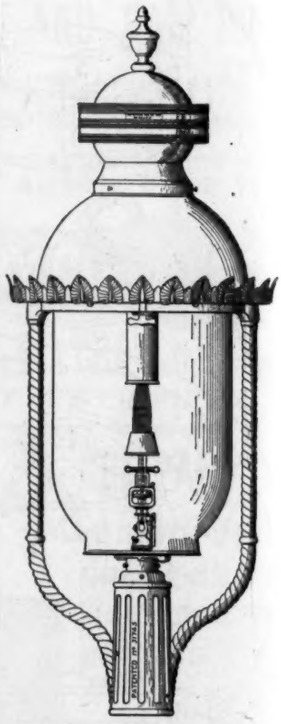

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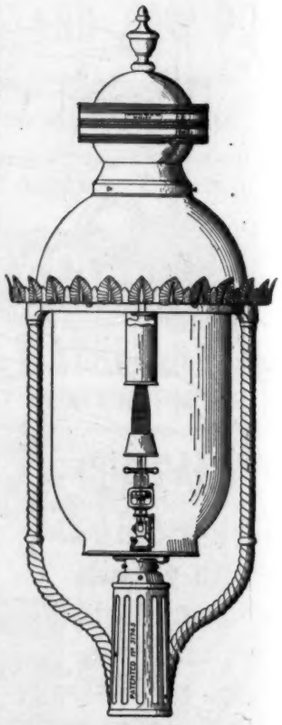

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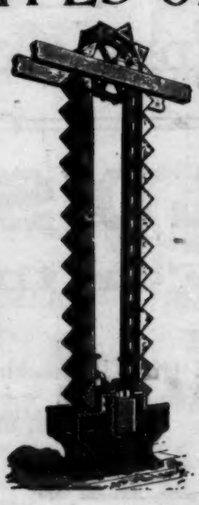

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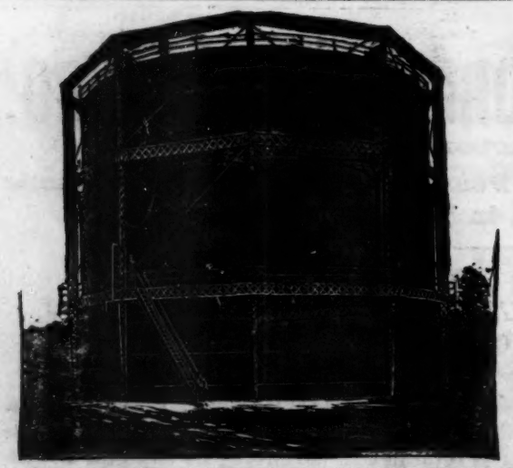

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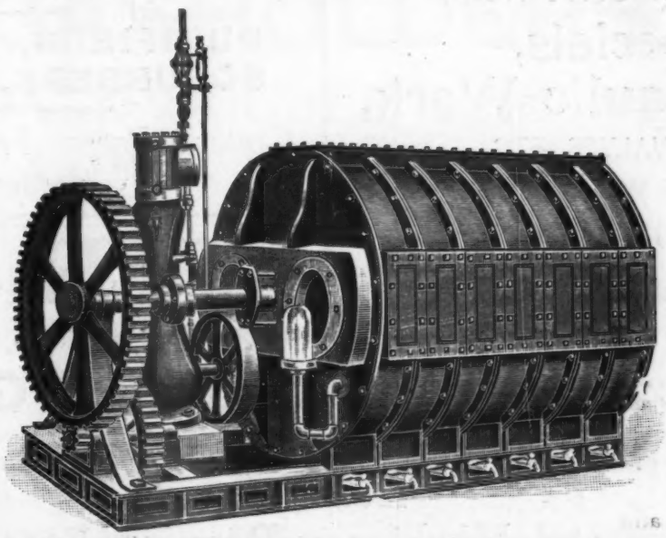

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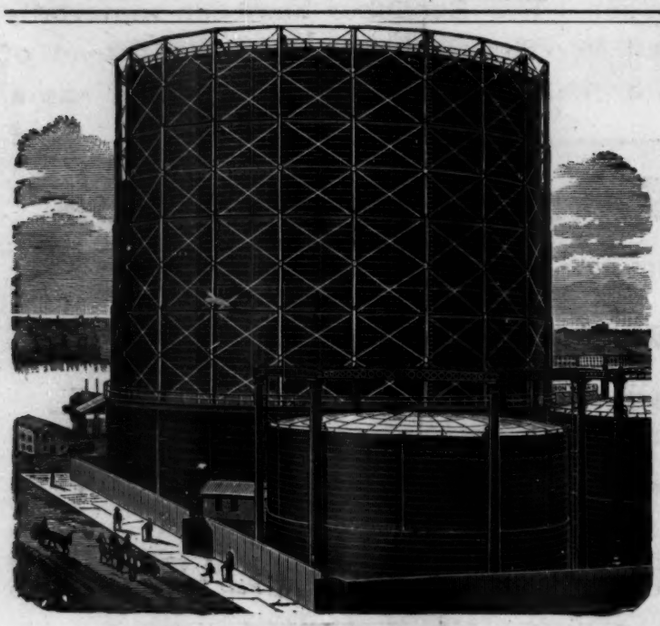

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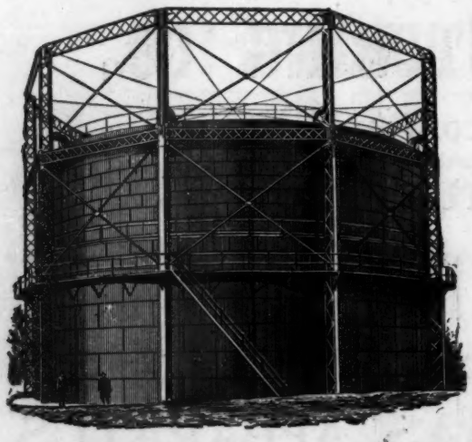

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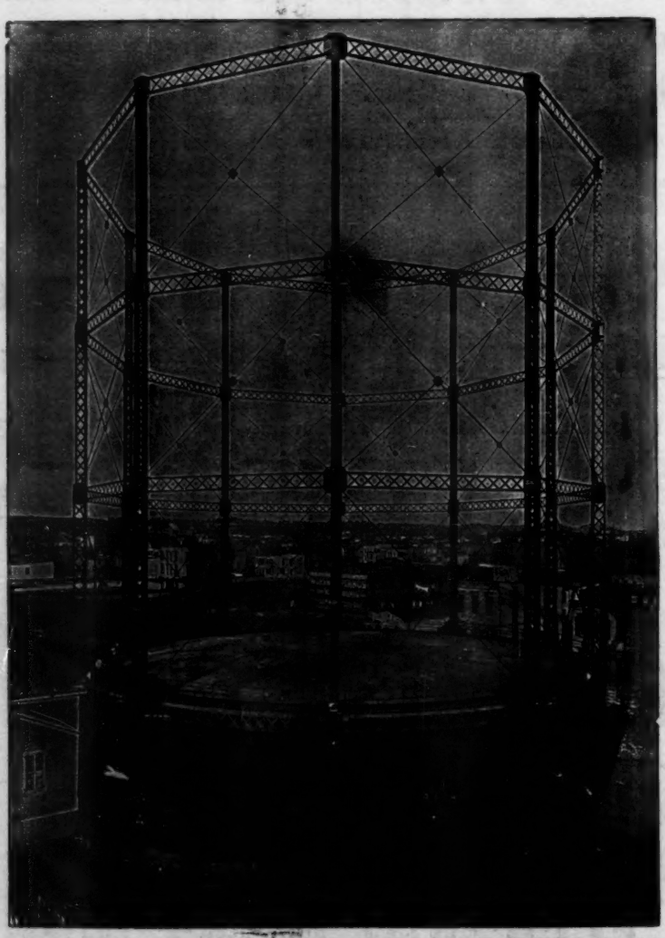

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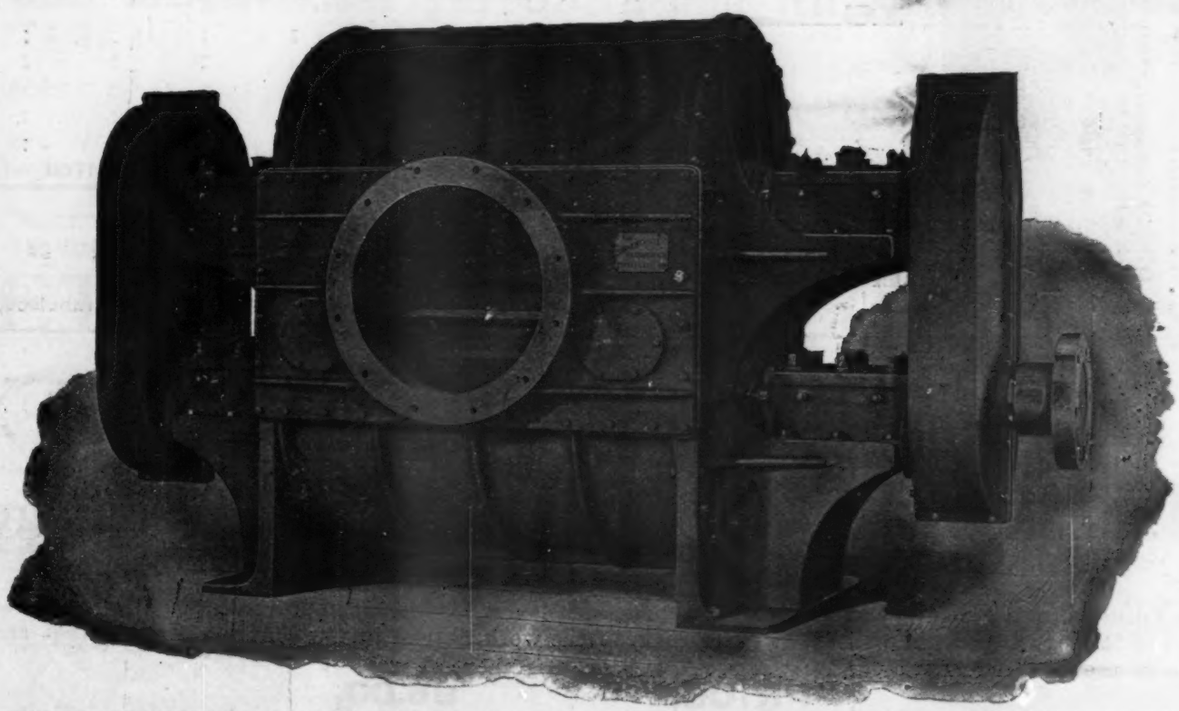

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